

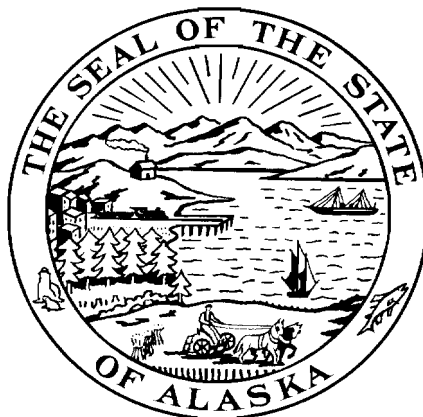
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STATE OF ALASKA

William A. Egan, Governor



ANNUAL REPORT OF PROGRESS, 1965 - 1966

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-7

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME
Walter Kirkness, Commissioner

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Sport Fish Division

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INTRODUCTION

This report of progress consists of Job Segment Reports conducted under the State of Alaska Federal Aid in Fish Restoration Project F-5-R-7, "Sport Fish Investigations of Alaska."

The project during this report period is composed of 18 separate studies. Some are specific to certain areas, species or fisheries, while others deal with a common need for information. Each job has been developed to meet the needs of various aspects of the State's recreational fishery resource. Seven jobs are designed to pursue the cataloging and inventory of the numerous State waters. These jobs, which are of a continuing nature, will eventually index the potential recreational fisheries. Four jobs are directed toward specific sport fish studies. These include specialized efforts toward the anadromous Dolly Varden of Southeastern Alaska, the silver salmon in Resurrection Bay, the king salmon stocks on the Lower Kenai Peninsula, the king salmon stocks in Upper Cook Inlet, and the Arctic grayling of the Tanana River system.

The statewide access program is developing rapidly. Our efforts in investigating existing and potential recreational sites and access has resulted in favorable action being taken on our proposals and recommendations submitted to the land management agencies at both the State and Federal levels.

The remaining jobs included a specialized creel census effort in Southeastern, an egg-take program designed to establish indigenous egg-take sources, and evaluation of the Fire Lake system.

Three special reports have been completed from past studies on the Dolly Varden study. These appear in the Department's "Research Report" series and are a direct result of the Federal Aid In Fish Restoration Program. To date, the following reports have been published: Research Report No. 3, "Some Migratory Habits of the Anadromous Dolly Varden Salvelinus malma (Walbaum) in Southeastern Alaska," 1965, Robert H. Armstrong; Research Report No. 4, "Annotated Bibliography on the Dolly Varden Char," 1965, Robert H. Armstrong; and Research Report No. 5, "Age and Growth of Anadromous Dolly Varden Char Salvelinus malma (Walbaum), in Eva Creek, Baranof Island, Southeastern Alaska," 1966, David W. Heiser.

The material contained in this progress report is often fragmentary in nature. The findings may not be conclusive and the interpretations contained herein are subject to re-evaluation as the work progresses.

RESEARCH PROJECT SEGMENT

STATE: ALASKA Name: Sport Fish Investigations of Alaska.
Project No.: F-5-R-7 Title: Evaluation of the King Salmon Sport Fisheries on the Lower Kenai Peninsula.
Job No.: 7-B-2

Period Covered: July 1, 1965 to June 30, 1966.

ABSTRACT

King salmon, Oncorhynchus tshawytscha, spawning populations were again estimated for the major lower Kenai Peninsula streams. Aerial and foot counts indicated 3,645 king salmon in the Anchor River, Ninilchik River, Deep Creek and Stariski Creek. The Anchor River population was estimated at 1,600 fish. Size and sex compositions, determined from carcasses, are presented.

RECOMMENDATIONS

1. It is recommended that escapement surveys be continued on the lower Kenai Peninsula king salmon streams to determine population trends.
2. It is recommended that a creel census be initiated on lower Kenai Peninsula marine waters to collect information on king salmon harvest, angler effort, and age composition.

OBJECTIVES

1. To investigate and measure the king salmon population trends in the major recreational fishing streams on the lower Kenai Peninsula.
2. To provide recommendations for the management of king salmon in these waters, and to direct the course of future studies.

TECHNIQUES USED

King salmon spawning populations were estimated by aerial and foot surveys as outlined by Logan (1963) and Engel (1964).

Size and sex ratio information was obtained by examining carcasses on the spawning grounds. The fork length of each fish was determined to the nearest 0.5 cm.

FINDINGS

In December, 1963 the Alaska Board of Fish and Game closed Cook Inlet and its drainages to sport and commercial king salmon fishing. A long-term investigation, initiated in 1960, was continued during this report segment to determine the effect of the closure on lower Kenai Peninsula spawning stocks.

The Anchor River, because of past escapement information, again served as an index stream to measure population trends. Anchor River king salmon escapements have been enumerated by use of weirs in 1954 and 1957 (Allen, 1954, 1957) and by foot and aerial surveys since 1960 (Dunn, 1960; Logan, 1961, 1962, 1963; Engel, 1964). Because foot and aerial estimates are based on visual counts they are believed minimal and are viewed as an index to total population size.

Population Enumeration

Foot and aerial surveys were timed to coincide with the peak of spawning and extended from July 26 to August 8. Adverse survey conditions (turbid water and cloudy weather) prevailed throughout much of this period and undoubtedly affected the reliability of the estimates.

The Anchor River spawning population was estimated to be 1,600 king salmon, the second largest in the last six years of observation (Table 1). Although spawning estimates have shown a marked improvement during the past two years, they may not represent increased total runs because of the eliminated sport fishery. Table 2 shows a relatively constant king salmon harvest from the Anchor River during the four years preceding the closure. If this rate of harvest had continued it appears that recent escapements would have been similar to those of the past.

TABLE 1 - Estimated Anchor River King Salmon Escapements for Past Years.

| <u>Year</u> | <u>Escapement</u> | <u>Method of Determination</u> | <u>Agency</u> |
|-------------|-------------------|--------------------------------|---------------|
| 1954 | 2,700 | Weir counts | FWS |
| 1957 | 2,400 | Weir counts | FWS |
| 1960 | 1,200 | Aerial and foot surveys | ADF&G |
| 1961 | 850 | Aerial and foot surveys | ADF&G |
| 1962 | 970 | Aerial and foot surveys | ADF&G |
| 1963 | 1,340 | Aerial and foot surveys | ADF&G |
| 1964 | 1,700 | Aerial and foot surveys | ADF&G |
| 1965 | 1,600 | Aerial and foot surveys | ADF&G |

TABLE 2 - The Estimated King Salmon Harvest, Effort (Man-Days) and Catch Per Hour on the Anchor River for Past Years.

| <u>Year</u> | <u>Harvest</u> | <u>Effort</u> | <u>Catch/hour</u> | <u>Period of Census</u> |
|-------------|----------------|---------------|-------------------|-------------------------|
| 1954 | 355 | 2,640 | 0.034 | 5/28 to 7/22 |
| 1955 | 870 | 2,010 | 0.099 | 5/28 to 7/8 |
| 1957 | 335 | 4,590 | 0.024 | 5/1 to 7/9 |
| 1960 | 1,150 | 5,300 | | 5/7 to 7/14 |
| 1961 | 1,012 | 6,165 | 0.059 | 5/20 to 7/4 |
| 1962* | 502 | 2,325 | 0.053 | 5/19 to 6/27 |
| 1963 | 1,158 | 5,747 | 0.047 | 5/23 to 7/5 |
| 1964 | | | | Season closed |
| 1965 | | | | Season closed |

* Reduced harvest and effort were caused by unfavorable fishing conditions.

The estimated spawning populations in the Ninilchik River, Deep Creek, and Stariski Creek are presented in Table 3. The number of spawners in the Ninilchik River was the largest in four years of record and twice those of 1962 and 1963. Estimates for Deep Creek and Stariski Creek were less than 1964, but were similar to the two years preceding the closure.

TABLE 3 - Estimated King Salmon Escapements in Lower Kenai Peninsula Streams, 1962-65.

| <u>Stream</u> | <u>1962</u> | <u>1963</u> | <u>1964</u> | <u>1965</u> |
|-----------------|-------------|-------------|-------------|-------------|
| Deep Creek | 745 | 605 | 800 | 690 |
| Ninilchik River | 525 | 450 | 910 | 1,025 |
| Stariski Creek | 355 | 265 | 580 | 330 |

Length and Sex Composition

In addition to population enumeration, all king salmon carcasses encountered on the Anchor and Ninilchik Rivers were examined for sex and size composition. A total of 168 carcasses was recovered from the Anchor River on August 7 and 8. Length-frequency distributions for both sexes are shown

in Figure 1. Average fork lengths for males and females were 83.5 and 90.7 cm, respectively. Precocious males less than 50.0 cm (20 inches) in length comprised 2.0 percent of the carcass sample. Ten percent of the 1963 sport catch and 4.8 percent of the 1964 carcass sample were precocious males. It is important to note that the size composition of the sport catch is biased slightly because of a more liberal bag limit for king salmon under 20 inches long. The 1965 male to female sex ratio of 1.7:1 was the highest ratio of males recorded for the Anchor River (Table 4).

TABLE 4 - The Male to Female Sex Ratio for Anchor River King Salmon, 1960-65.

| <u>Year</u> | <u>Sex Ratio</u> | <u>Sample Size</u> | <u>Method of Determination</u> | <u>Period of Sample</u> |
|-------------|------------------|--------------------|--------------------------------|-------------------------|
| 1960 | 0.9:1 | 199 | Sport catch | 5/21-8/13 |
| 1961 | 1.2:1 | 112 | Sport catch | 5/25-6/30 |
| 1962 | 0.8:1 | 71 | Sport catch | 5/22-6/27 |
| 1963 | 1.0:1 | 157 | Sport catch | 5/22-7/5 |
| 1964 | 1.4:1 | 104 | Carcasses | 7/27-8/11 |
| 1965 | 1.7:1 | 168 | Carcasses | 8/7-8/8 |

Figure 2 illustrates the length-frequency distribution of 93 king salmon carcasses from the Ninilchik River. The mean length of females (89.3 cm) was 4.4 cm greater than that of males (84.9 cm). A similar size distribution occurred in 1964 when females and males averaged 86.9 and 80.5 cm, respectively. The percentage of precocious males (5.4 percent) was similar to that recorded for 1964 (6.0 percent). Males and females were equally represented in the carcass sample, whereas in 1964 males predominated at a 1.4:1 ratio.

The Alaska Board of Fish and Game in December, 1965 opened Cook Inlet to saltwater sport fishing for king salmon. The harvest is expected to be low because most of Cook Inlet is too silty for successful sport fishing. Extreme tides and frequent stormy weather further restrict angling opportunities in salt water. Should a fishery develop, it would likely occur off stream mouths in the lower Inlet or in Kachemak Bay where the water is clear. In either case Kenai Peninsula stocks would probably be prime contributors to the harvest.

The 1965 incidental commercial king catch of 8,266 fish was nearly double that recorded for Cook Inlet in 1964 (4,622 king salmon). The bulk of these fish were bound for two major Kenai Peninsula streams, the Kenai and Kasilof Rivers (Rearden, 1965).

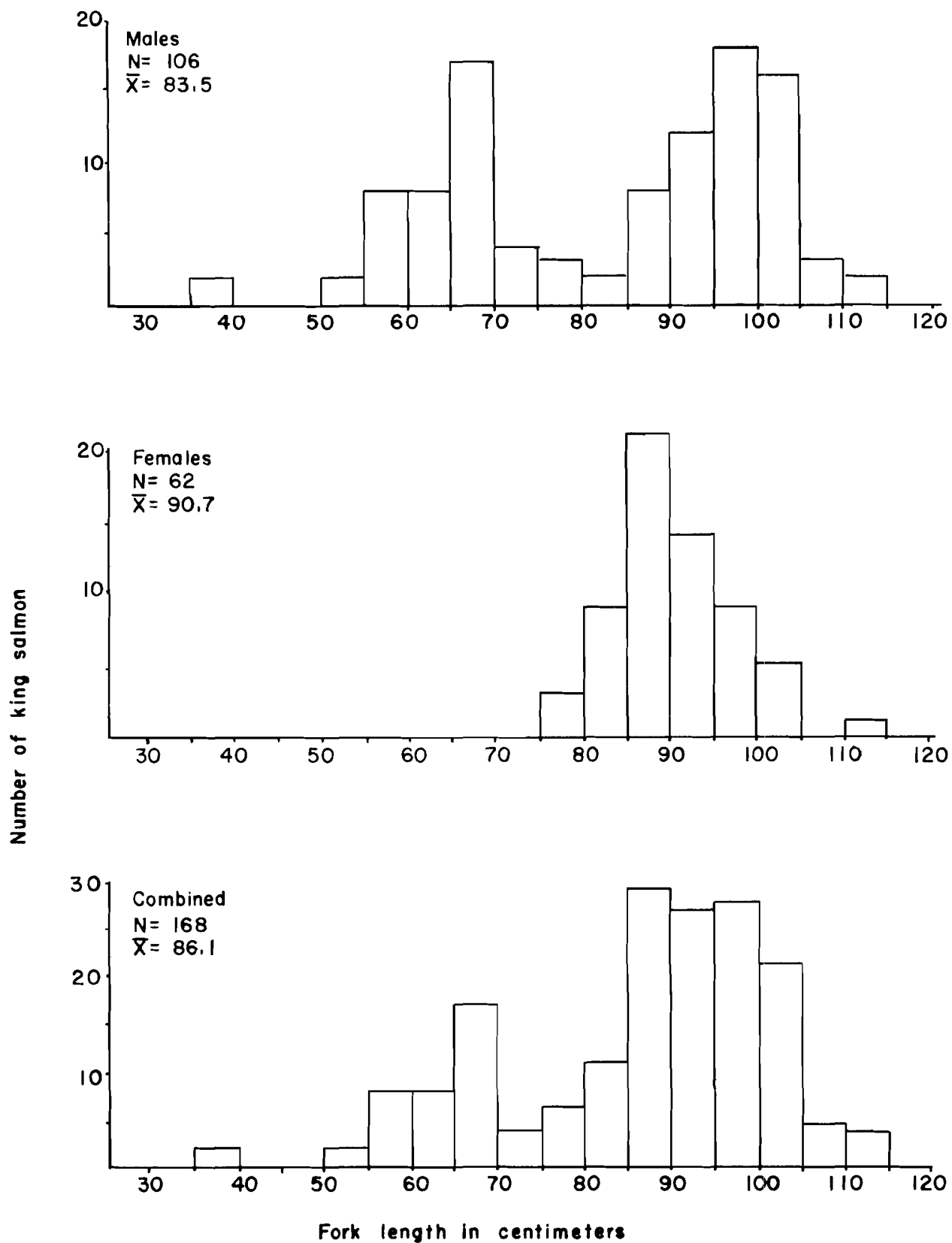


Figure 1. Length frequency of king salmon carcasses from the Anchor River, 1965.

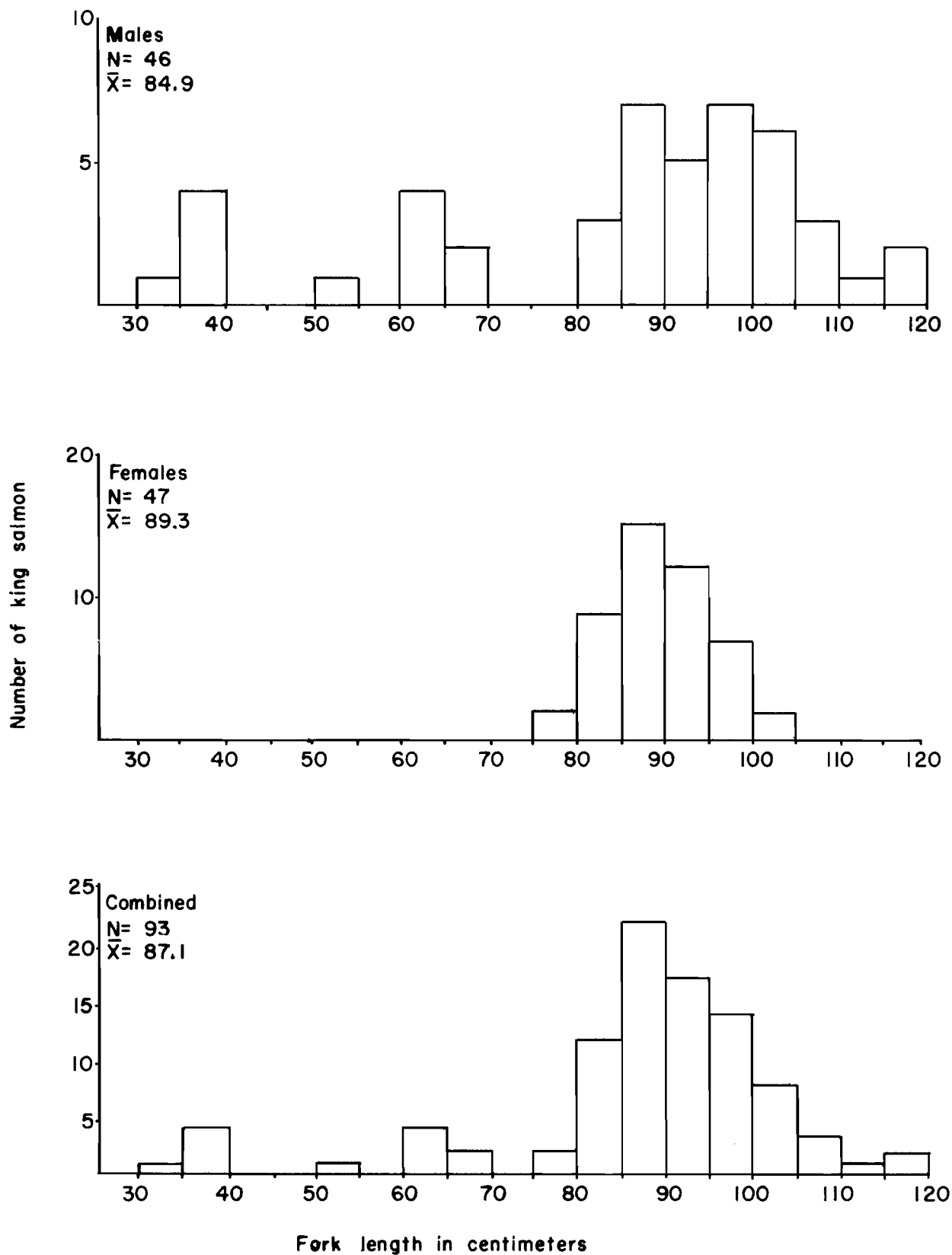


Figure 2. Length frequency of king salmon carcasses from the Ninilchik River, 1965.

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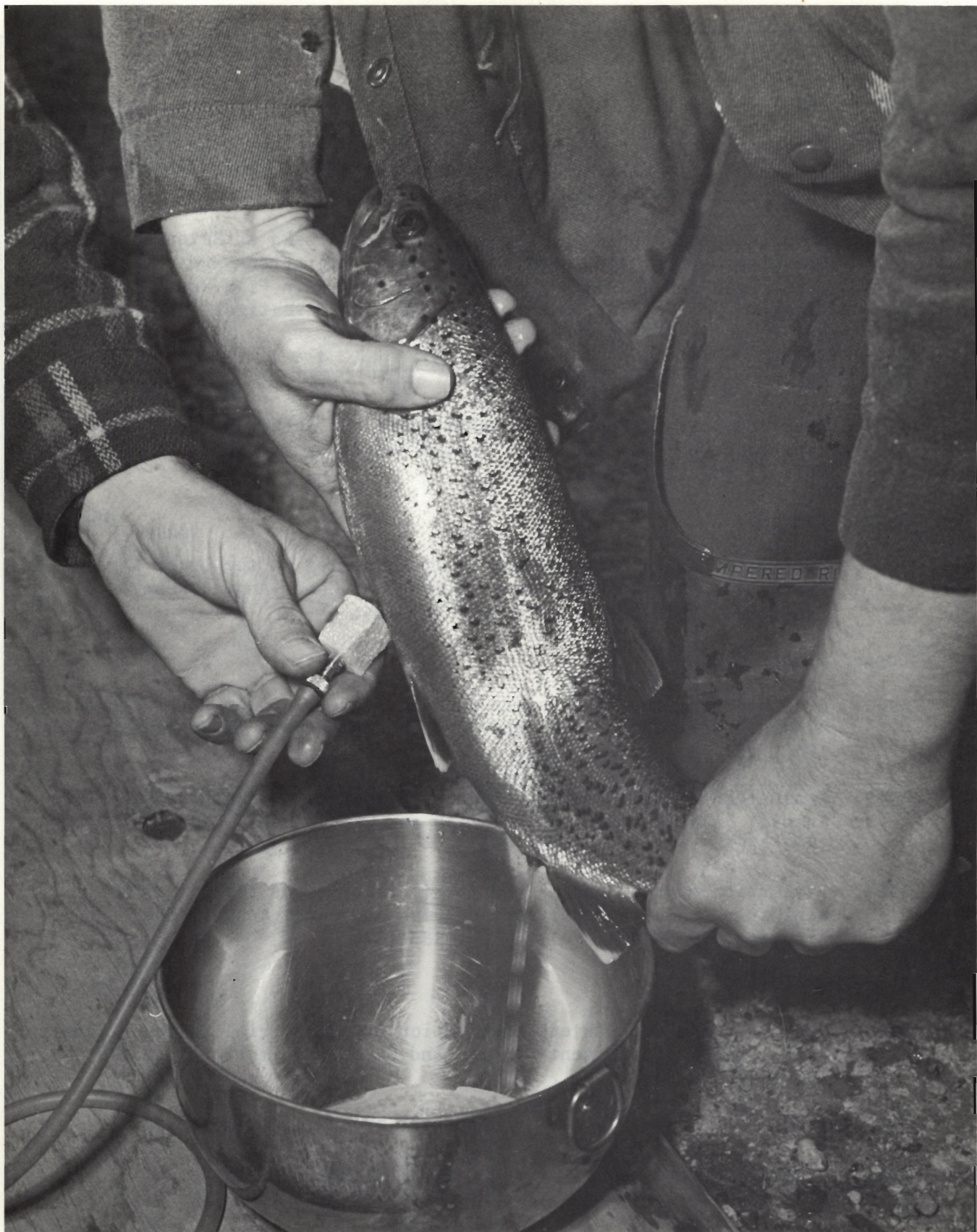
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Sidney M. Logan
Fishery Biologist

s/ Alex H. McRea, Director
Sport Fish Division

Date: July 15, 1966



"Air Spawning." By Injecting Air into the Body Cavity, Artificial Spawning can be Achieved with the Least Injury to the Fish.